(54) Title: REMOTE TERMINAL UPDATING
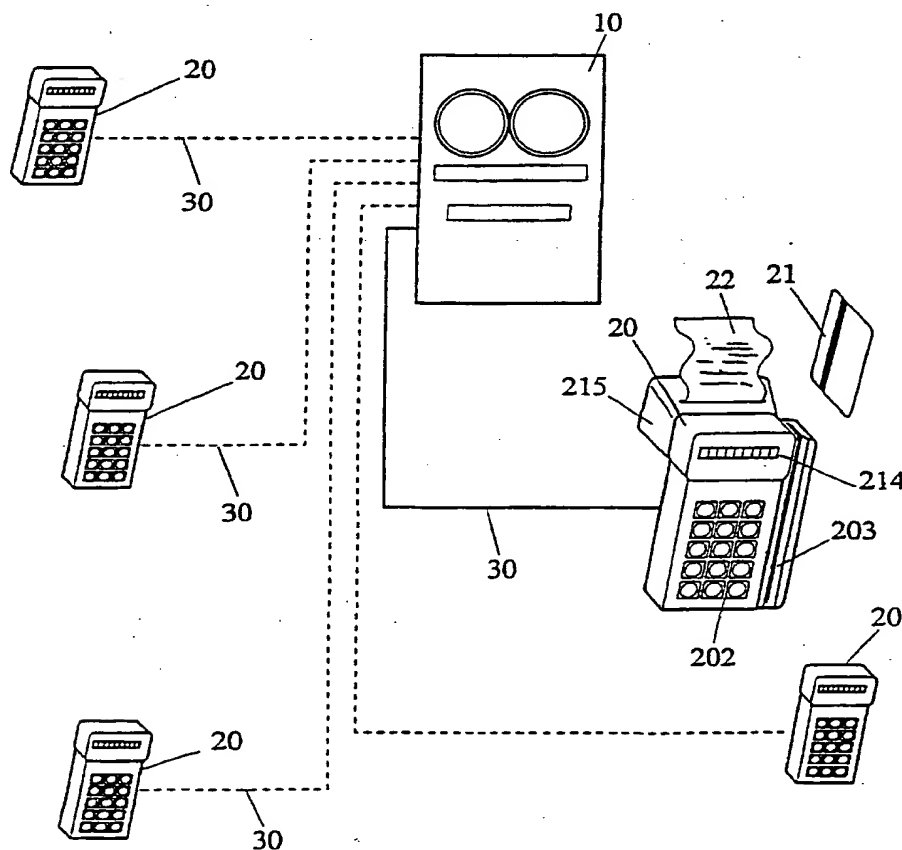
(57) Abstract: A method and apparatus for allowing transfer of data to remote terminals during dead time in a transaction. When a terminal (20) accesses a remote host (10), for example to authorise a financial transaction, it is common for there to be a delay between receiving the request and transmitting approval. It is disclosed that this dead time can be used to send data to the terminal, for example to update software, display advertisements, or download data to a smartcard, without the necessity to establish a separate communications link.

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REMOTE TERMINAL UPDATING

Technical Field of the Invention

The present invention relates generally to data transfer with terminals and in particular to the transfer of data between at least one host computer and one or more remote terminals. More particularly the present invention has application to, but is not limited to, communications with remote funds transaction terminals, self-service transaction terminals as well as hardwired and wireless Electronic Funds Transfer Point of Sale (EFTPOS) terminals.

Background Art

Convenient access to various products and/or services at any time of the day is becoming a general consumer requirement. Such access is generally provided by terminals situated in convenient locations and located remote from a host location. For example, EFTPOS terminals and automated bank teller machines are remote terminals now being located in shopping centres and the like to fulfil our out-of-bank banking needs. Similarly, other self-service transaction terminals, such as ticket purchasing machines using smart cards, may be configured as such.

Figure 1 is an illustration of a known EFTPOS system, and shows a plurality of terminals 20 connected through a communication channel 30 to a single host computer 10. As indicated above, the terminals 20 are often located in shops and other remote locations, while the host computer 10 is located at a central data collection point, such as at the service provider's main computer facility. The functions of this host computer include management of encryption systems, authorisation of transactions and management of communications with remote terminals 20.

Due to the high cost of dedicated communication channels, the communication channel 30 of choice is typically one where a connection is established on a needs basis. For example, the remote terminal 20 would normally establish a connection with the host computer via a telephone line whenever the remote terminal 20 is required to perform an on-line transaction by a

user. Alternatively, the host computer 10 may establish the connection with one of the remote terminals 20.

In use, a customer's card, such as a bank card or smart card 21 is read by the card reader 203 of the remote terminal 20 to obtain appropriate data, such as the user's bank details. The customer would then be required to enter transaction information, such as account type, transaction amount and/or ticket information in the keypad 202. A personal identification number (PIN) may also be required before the information is sent to the host computer 10 for authorisation. The information may be encrypted for data security.

Periodically each of these remote terminals 20 require data to be transferred to them, such as update data. Traditionally this may require a technician to visit each of the remote terminals 20 and by connecting another device (not illustrated) to the remote terminal 20 the required data would be downloaded to the remote terminal 20. Logistically this solution is very undesirable.

Alternatively, the host computer 10 may, in succession, establish a connection with each of the remote terminals 20 in order to download the update data to each of the remote terminals 20. A disadvantage of this method is that the remote terminal 20 is unavailable to users during this download time. A further disadvantage is that additional telecommunication costs may also incurred, both for establishing and maintaining the connection 30.

Disclosure of the Invention

It is an object of the present invention to transfer data, such as update data to remote terminals from a host computer without establishing a connection for this purpose.

According to a first aspect of the invention, there is provided a method of transferring additional data between a remote terminal and a host during an established communication, the additional data being incidental to the communication, including the step of transferring the additional data between the remote terminal and the host terminal during a period of communication inactivity such as "dead time".

According to another aspect of the invention, there is provided a method of operating an electronic funds transfer terminal to receive update data from a host, said method including the sequential steps of: establishing a communication with said host over a communications channel; requesting an authorisation of a transaction by said host over said communications channel; receiving said update data from said host over said communications channel; updating a memory means of said electronic funds transfer terminal with said update data; and transferring funds upon receipt of a positive authorisation from said host.

According to a further aspect of the invention, there is provided apparatus for implementing the aforementioned methods.

Advantageously, the present invention provides a method and system wherein a communications channel between a remote terminal and a host computer is used to transfer additional data during times when the communications channel would otherwise be inactive during a communication session, without establishing a communication session for the purpose of transferring the additional data to the remote terminal.

It is to be appreciated that the "additional data" may take various forms, for example including update data for the remote terminal and/or a data card entered into the terminal and data relating to advertisements to be displayed on the display device of the remote terminal. Where the additional data relates to data required by the remote terminal and /or data card entered into the terminal for their every day operation, this data may relate specifically to the particular terminal or card or may be general data being sent to all or a selected number of, remote terminals and/or all data cards using the terminals.

Brief Description of the Drawings

Fig. 1 shows a schematic block diagram of a prior art Electronic Funds Transfer Point Of Sale (EFTPOS) system.

A number of preferred embodiments of the present invention will now be described with reference to the drawings, in which:

Figs 2A and 2B are more detailed schematic block diagrams of a remote

terminal, such as an electronic funds transfer point of sale (EFTPOS) terminal and host computer of the system illustrated in Fig. 1 upon which the preferred embodiments of the present invention may be practiced; and

Figs 3A to 3C are flow diagrams for communication used in the preferred
5   embodiments of the present invention.

Detailed Description

The preferred embodiments of the invention are preferably practiced using remote terminals 20 and host computer 10, such as that shown in Figs 2A
10   and 2B respectively. In particular, the preferred embodiments are effected by instructions in software that are carried out by the host computer 10 and remote terminals 20.

It is to be appreciated that the remote terminal may take various configurations, including a hard-wired EFTPOS terminal, an automatic teller
15   machine (ATM), a mobile EFTPOS machine, as used by mobile service providers, such as taxi drivers, and mobile telephones and other mobile telecommunications devices, preferably with WAP (Wireless Access Protocol) capabilities.

Referring to Fig. 2A, the remote terminal 20 may include a computer module 201, input devices such as a keypad 202 and card reader 203, and output
20   devices including a receipt printer 215 and a display device 214. Especially when the remote terminal 20 is a hard-wired terminal, it may share the printer 215 with a cash register (not illustrated) and is used for providing a report 22 on a transaction that has occurred or other information relating to the transaction. The card reader 203 reads a user's card 21 in order to obtain data from the user's card. In Figure
25   2A, the card information is read via a magnetic strip, but this is not essential to the invention. In this regard it will be appreciated that the present invention may be applied not only to magnetic stripe cards, but also to alternative systems such as smartcard systems, stored value loading arrangements, and the like.

The keypad 202 allows the user to enter transaction particulars while the
30   display device displays messages or instructions to the user. As a further option, the user may also be required to enter a PIN.

A Modulator-Demodulator (Modem) transceiver device 216 is used by the remote terminal for communication to and from the host computer 10 via communication channel 30. This channel is preferably a dedicated communication channel, such as telephone line, although it may be any other communication

5 means, including a radio channel and a permanent web connection.

Each computer module 201 typically includes at least one processor unit 205, a memory unit 206, for example formed from semiconductor random access memory (RAM) and read only memory (ROM), input/output (I/O) interfaces including a display interface 207, and an I/O interface 209 for the keypad 202,

10 receipt printer 215 and card reader 203, and an interface 208 for the modem 216. The interface 207 may be any display means including a video interface or a Liquid Crystal Display (LCD). The components 205 to 209 of the computer module 201, typically communicate via an interconnected bus 204. The components, however, may communicate via any other communication means,

15 including via wireless communications.

The computer module may further include an on-line printer and storage device such as a hard disk drive and/or magnetic tape drives.

The host computer may take a variety of configurations, with the main requirements being the ability to communicate with remote terminals. An example

20 host computer 10 is shown in Fig. 2B, which includes a Modulator-Demodulator (Modem) transceiver device 116 for communication to and from the remote terminals 20 via dedicated communication channel 30.

Typically, the application program of the preferred embodiment is resident on the memory units 106, 206 of the host computer and remote terminals, and

25 controlled in its execution by the processors 105 and 205 respectively.

In Fig. 3A a flow diagram is shown of a first embodiment of the present invention. In use, the remote terminal's computer module 201, and in particular the processor 205, is activated by a customer's card 21, in this embodiment, a smart card, which is read by the card reader 103 to obtain the customer's details.

30 After this initial reading by the card reader, the customer may also be required to enter a personal identification number (PIN), as well as select an account type

and/or specify a transaction. The remote terminal 20 establishes communication with the host computer 10, such as by dialing a predetermined telephone number, which may be pre-programmed in memory 106. However, communication may be established via any means. Any or all communication to and from the host

5   computer 10 may also be encrypted. For example, if the customer is required to enter a PIN, it is possible to only encrypt the PIN.

The remote terminal 20 sends the necessary information to the host computer 10, such as card details and possibly any information entered by the customer, in an Authorisation Request message 301 for authorisation of the

10   transaction by the host computer 10.

In this embodiment, a report printer is also incorporated into the configuration, although this is not an essential element. When the printer is incorporated, the printer 215 is preferably controlled by the computer module 201 of the remote terminal, which sends a print message 302 from the remote terminal

15   to the printer 215 to start printing the transaction report 22.

On receipt of the Authorisation request 301 from the remote terminal 20, the host computer 10 performs a review of the customer's account status, either within its own network, or commonly by communicating with the card issuer's system. Appropriate accounting entries are made in the card issuer's system, and

20   an Authorisation Response message 303 (which may be positive or negative) is transmitted via host computer 10 to the remote terminal. This aspect operates in a manner conventional for Point of Sale systems.

In prior art arrangements, the remote terminal pauses while waiting for an Authorisation Response message 303 from the host computer 10. This period,

25   herein called "dead time", is variable, and may be several seconds in duration. However, in accordance with the present invention, additional data, such as in the form of loyalty information, is transferred 304 from the host computer 10 to the remote terminal 20 after the Authorisation request 301 is received by the host computer 10.

30   On successful receipt of the loyalty information 304, the remote terminal 20 transfers the received loyalty information 304 to the smart card 21 in a loyalty

information transfer 305. The smart card 21 responds with a response message 306, which the remote terminal forwards to the host computer 10 as response message 307.

It is also to be appreciated that the messages passed between the host computer/remote terminal and the remote terminal/smart-card (for example at steps 304, 305 respectively), need not be the same. For instance, the information sent at step 304 might include message display information as well as data for the smart-card, but step 305 only includes the smart-card data.

Once the remote terminal 20 receives the Authorisation response message 303, the remote terminal 20 may complete the transaction by forwarding the authorisation response to the smart-card.

Further, in the embodiment with the report printer, the remote terminal would complete the printing of the receipt 22 by also sending a print message 308 to the printer 115 and then perhaps by sending yet another print message 309 to the printer, this time regarding the loyalty information.

In addition, there are various possible approaches to coordinating the additional information sent to the remote terminal with the authorisation response. For example, referring to Figure 3A, it would appear that the host computer does not forward the authorisation response 303 until the smart-card/remote terminal combination have sent a response (306/307) regarding the loyalty information, being the additional information sent during the usual "down time". However, this need not always be the case, as various other configurations are possible. For example, the host computer could send the authorisation response independently of the reply from the smart card/remote terminal about the additional loyalty information. With this configuration, should the remote terminal/smart-card not have finalised the loyalty information update, by the time the authorisation response is received, the update could be aborted and continued on the next transaction.

Fig. 3B shows a timing diagram of a further embodiment of the invention. Once again, the card reader 103 to obtain the customer's details reads a customer's card 21. The remote terminal 20 establishes communication with the

host computer 10 and sends the customer's details etc to the host computer 10 in the Authorisation Request message 301 for authorisation of the transaction by the host computer 10.

In this embodiment of the invention, the update data, which is transferred
5   from the host computer 10 to the remote terminal 20 after the Authorisation request 301 is received by the host computer 10, is an advertisement message 310.

The actual form of transmission of this advertisement may take various forms. For example, the whole advertisement(s) may be downloaded from the
10   host computer or the advertisements may have been previously loaded into the remote terminal, so that the data downloaded to the remote terminal via 310 simply specifies which advertisement(s) to display. As a further alternative, where the transaction is a wireless transaction, such as an EFTPOS transaction on a mobile EFTPOS unit, or even a mobile phone, the information displayed on the
15   mobile unit could be from a particular web site accessed via WAP (Wireless Application Protocol).

On successful receipt by the remote terminal 20 of the advertisement data 310, the advertisement is displayed in step 311 on display 214 of the remote terminal 20. If the advertisement has been newly downloaded from the host
20   computer, it may also be stored 312 in the memory 206 for later retrieval.

Once the host computer 10 has processed the authorisation request 301, it sends an Authorisation response message 303 to the remote terminal 20 to complete the transaction.

As a further alternative in this embodiment of the invention, the remote
25   terminal 20 may also continue to display 311 the advertisement on display 214 until the next customer card 21 is entered to start a new transaction.

A timing diagram of yet a further embodiment of the invention is shown in Fig. 3C. The remote terminal 20 in this embodiment stores a "blacklist". A blacklist, for example may be a list of existing customers to whom service has
30   been disallowed or at least minimised. The remote terminal may display the blacklist stored in its memory on display 214, while it is not visible to the public.

In order to start a new transaction, the customer's card 21 is read 313 by the card reader 103 to obtain the customer's details. Only after the remote terminal 20, and in particular the processor 205 has verified that the entered card is not listed on the current blacklist 314, is communication established with the host computer 10 in the form of an authorisation request 301.

A blacklist data message 315 is transferred from the host computer 10 to the remote terminal 20 after the Authorisation request 301 is received by the host computer 10. The blacklist data message 315 may download a new blacklist or alternatively only send an update of the current blacklist to the remote terminal 20. On successful receipt of the blacklist data message 315 by the remote terminal 20, the current blacklist is updated or replaced with the downloaded data and stored in the memory 206 in step 316 for later retrieval.

Once the host computer has processed the authorisation request, it sends an Authorisation response message 303 to the remote terminal 20 to complete the transaction.

As an alternative to this embodiment, the remote terminal need not automatically check the details of the customer's card against the blacklist before seeking an authorisation request. This validation of the customer may instead be undertaken by the host, with the copy of the blacklist on the remote terminal simply for reference by the operator of the remote terminal, such as the merchant.

In a further embodiment of the present invention, instead of additional data being sent to the remote terminal/data card by the host computer during the "dead time", additional data may instead be sent to the host from the smart card and/or the remote terminal. For example, the smart card/remote terminal could send the host computer statistics or data history during the "dead time".

The foregoing describes only some embodiments of the present invention, and modifications and/or changes can be made thereto without departing from the scope and spirit of the invention, the embodiments being illustrative and not restrictive.

For example, in the embodiments of Figure 3B and 3C the remote terminal may have printing capabilities.

In addition, it is not necessary that there be only one host computer. In this regard, it is still within the inventive concept for more than one host to provide instructions to the remote terminals. For example, two host terminals may communicate with each remote terminal, such that a first host performs the required authorisation steps, while another host performs data updating tasks.

It will be appreciated that variations and additions are possible within the general inventive concept disclosed.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1.   A method of transferring additional data between a remote terminal and a host during an established communication, the additional data being incidental to the communication, including the step of:

5   transferring the additional data between the remote terminal and the host terminal during a period of communication inactivity such as "dead time".

2.   A method of operating a host terminal to send additional data to a remote terminal including the steps of:

10   receiving a request from the remote terminal for transaction information;

           processing the transaction request;

           sending additional data to the remote terminal while the request is being processed;

           sending information relating to the transaction request to the remote

15   terminal.

3.   A method of operating a remote terminal to receive additional data from a host, said method including the steps of:

           requesting transaction information from said host over a communications

20   channel;

           receiving said additional data from said host over said communications channel while the remote terminal awaits the requested information;

           updating a means associated with said remote terminal with said additional data; and

25   receiving the requested information from said host.

4.   A method of operating a remote terminal to send additional data to a host, said method including the steps of:

           requesting information from a host over a communications channel;

30   sending said additional data to the host over said communications channel while the remote terminal awaits the requested information; and

receiving the requested information from the host.

5.   A method of operating an electronic funds transfer terminal to receive update data from a host, said method including the sequential steps of:

5   establishing a communication with said host over a communications channel;

requesting an authorisation of a transaction by said host over said communications channel;

receiving said update data from said host over said communications

10   channel;

updating a memory means of said electronic funds transfer terminal with said update data; and

transferring funds upon receipt of a positive authorisation from said host.

15   6.   The method according to any one of claims 1 to 4 wherein the additional data received is at least one of:

(i)   update data;

(ii)   history data;

(iii)   advertisement data.

20

7.   The method of claim 6 wherein the additional data is update data, and the remote terminal is associated with a consumer's data card, and the method further includes the step of:

updating a memory means of the data card with the update data.

25

8.   The method of claim 6 wherein the additional data is update data, and the method further includes the step of:

updating a memory means of the remote terminal with the update data.

30   9.   A method according to claim 7, wherein said data card is a removable smartcard.

10. An electronic transaction terminal system including:

a host; and

a plurality of electronic transfer terminals, wherein each of said transfer

5 terminals are arranged to individually establish a communication with the host via a communications channel allowing data transfer, and said transfer terminals including:

a processor for requesting transfer information from said host over said communications channel;

10 means for receiving additional data from said host over said communications channel while the transfer terminal is awaiting the requested information;

means for updating a component associated with said transfer terminal with said additional data; and

15 means for processing a transaction upon receiving the requested information from said host.

11. A transfer terminal adapted to communicate with a host terminal, the transfer terminal including:

20 a processor for requesting transfer information from said host over a communications channel;

means for receiving additional data from said host over said communications channel while the transfer terminal is awaiting the requested information;

25 means for updating a component associated with said transfer terminal with said additional data; and

means for processing a transaction upon receiving the requested information from said host.

30 12. An electronic transaction terminal system including:

a host; and

at least one electronic transfer terminal, each of said electronic transfer terminals are adapted to communicate with said host via a communications channel allowing data transfer, wherein after said electronic transfer terminal has established communication with the host over the channel and has initiated a

5   request for transaction information to said host over said communications channel, additional data is transferred between said connected electronic transfer terminal and said host over said communications channel while said host is processing said an authorisation request.

10   13.   The system according to one of claims 10 to 12 wherein the additional data is at least one of:

(i)   update data;

(ii)   history data; or

(iii)   advertisement data.

15

14.   The system of claims 10 or 12 wherein the system is an electronic funds transfer system.

15.   The system according to claim 13, wherein said additional data is update

20   data, and said update data is stored in a memory means associated with said electronic transaction terminal.

16.   The system according to claim 15, wherein said memory means is a removable data card.
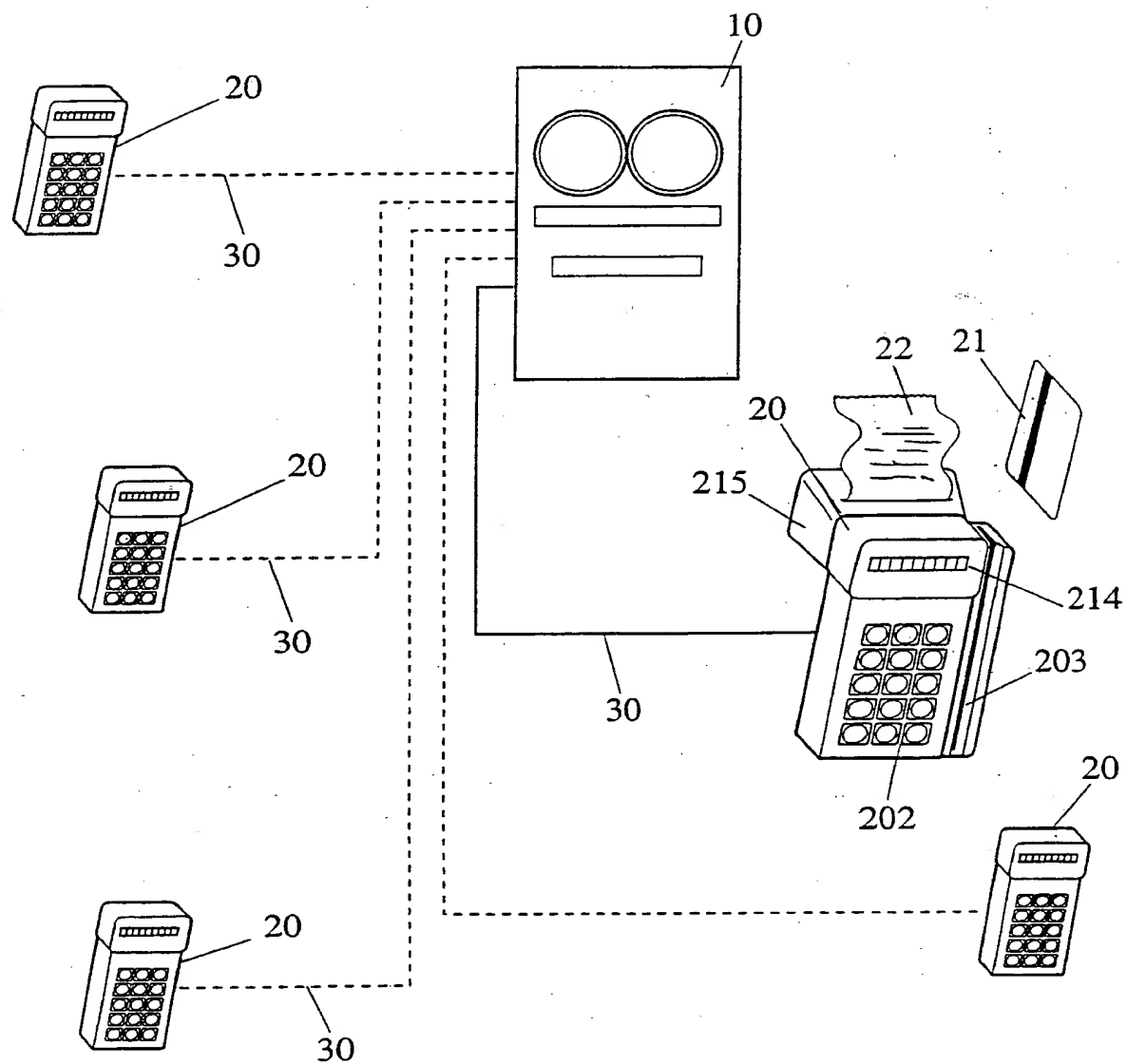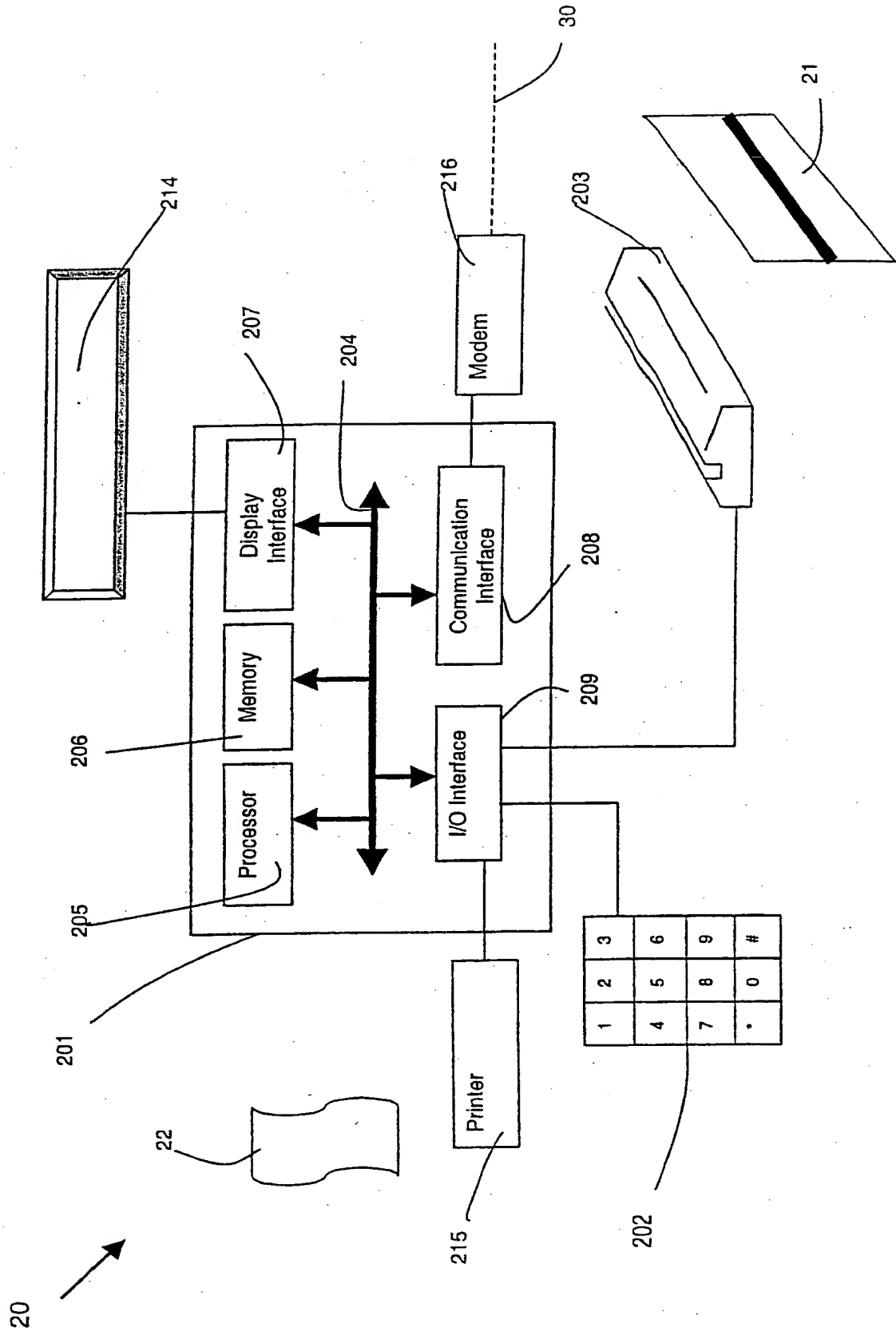
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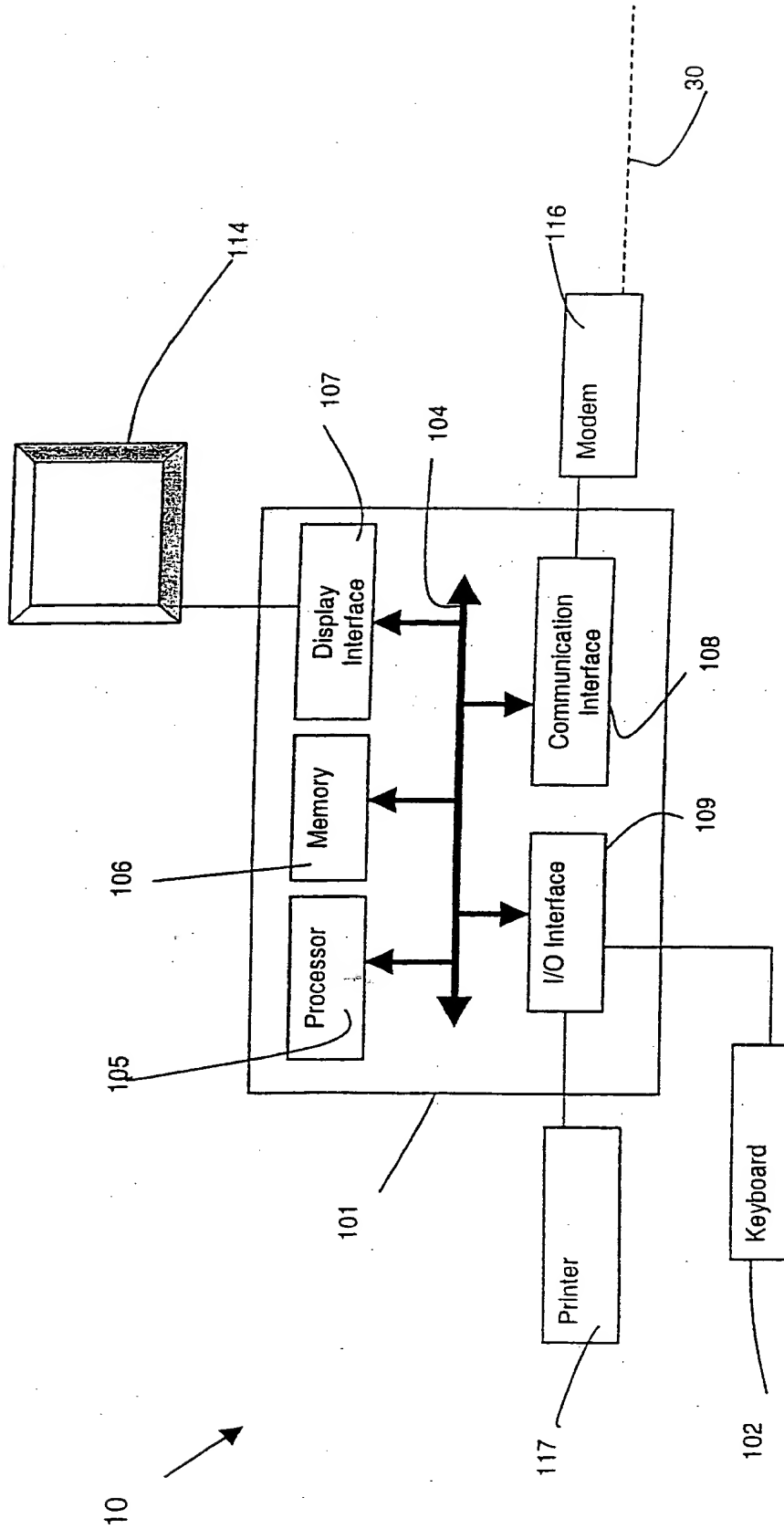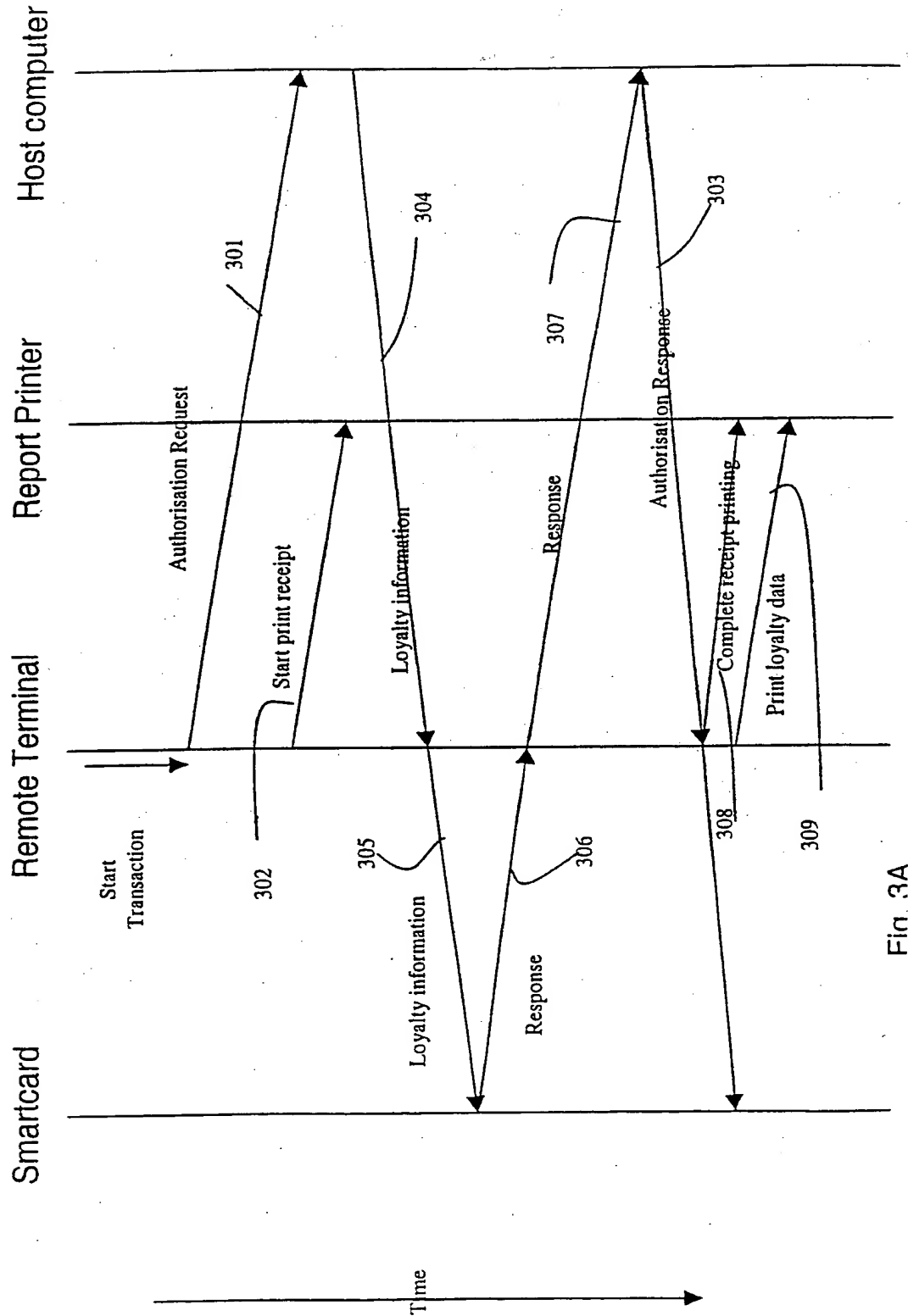17.   The system according to claim 16, wherein said memory means is a smart card.
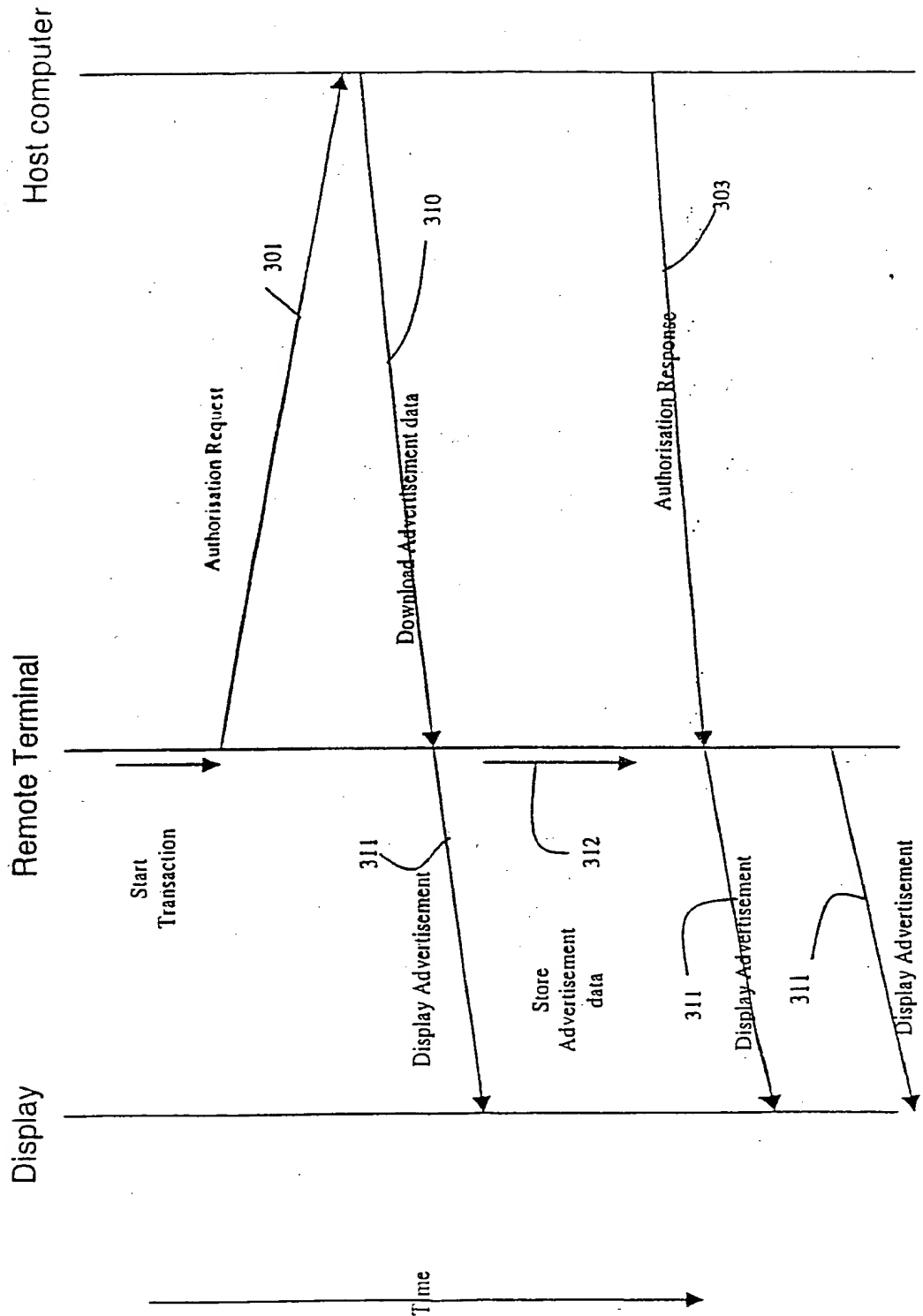
Fig 1.

Fig. 2B

Fig. 3A

Host computer

301 Authorisation Request
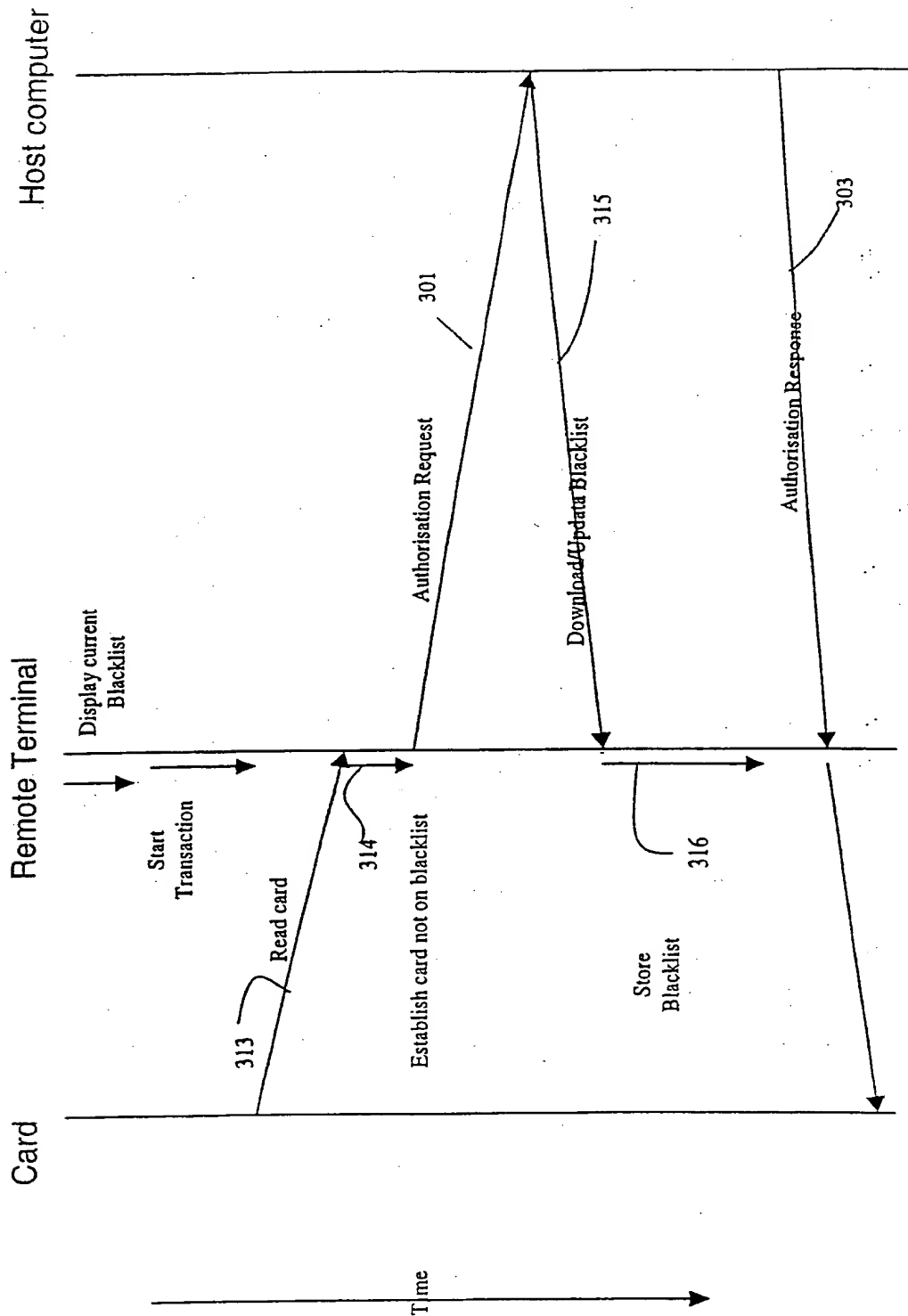
310 Download Advertisement data

303 Authorisation Response

Remote Terminal

Start Transaction

311 Display Advertisement

312 Store Advertisement data

311 Display Advertisement

311 Display Advertisement

Display

Time

Fig. 3B

| A. | CLASSIFICATION OF SUBJECT MATTER |

Int. Cl. [7]: G07F 19/00, 7/02, G07G 1/14

According to International Patent Classification (IPC) or to both national classification and IPC

| B. | FIELDS SEARCHED |

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT, Esp@cenet, USPTO Web Patent Database, "eftpos, idle time or period, waiting time or period, down time or period, advertisement, update etc"

| C. | DOCUMENTS CONSIDERED TO BE RELEVANT |

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Patent Abstracts of Japan, JP, 3-204259 A (Nippon Telegr & Teleph Corp) 5 September 1991	1-3,10-13,15,16
X	US, A, 5737619 (JUDSON) 7 April 1998 Column 10 lines 17 to 27 in particular.	1-3,10-13,15,16
X	WO, A, 98/47090 (SONY ELECTRONICS, INC.) 22 October 1998 Page 7 lines 1 to 11 in particular.	1-3,10-13,15,16
X	US, A, 4523087 (BENTON) 11 June 1985 Column 8 lines 1 to 46 in particular.	5-9
X	US, A, 5854897 (RADZIEWICZ et al.) 29 December 1998 Column 7 lines 3 to 11, column 26 lines 13 to 18 and column 27 lines 8 to 21 in particular.	1-4,10-13,15,16

☐ Further documents are listed in the continuation of Box C   ☒ See patent family annex

* Special categories of cited documents:

"A"   document defining the general state of the art which is not considered to be of particular relevance

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"P"   document published prior to the international filing date but later than the priority date claimed

"T"   Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"   Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"   Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"   document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 April 2001	18 april 2001
Name and mailing address of the ISA/AU	Authorized officer
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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member						
JP	3204259	NIL						
WO	98/47090	AU	71337/98					
US	5737619	AU	74588/96	CA	2235014	EP	856180	
		JP	11513829	US	5572643	WO	97/15020	
US	4523087	WO	82/03484	EP	76255			
US	5854897	AU	58106/98	WO	98/29810			

END OF ANNEX

Form PCT/ISA/210 (citation family annex) (July 1998)